

# Balancing Needs, Requirements and Affordability through Integrated Planning

CSO/Wet Weather Issues Specialty Conference

Terrance J. Sullivan  
Nancy Kelley Beaton

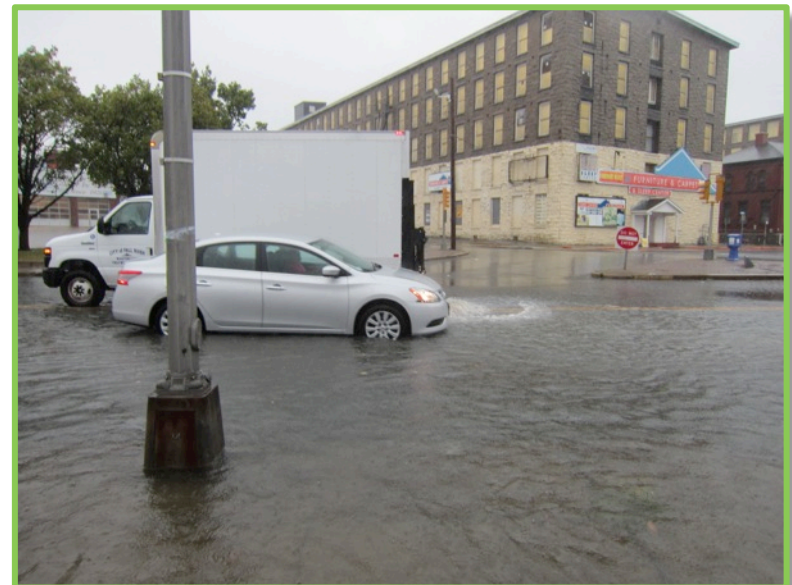
*October 26, 2015*



**CDM  
Smith**

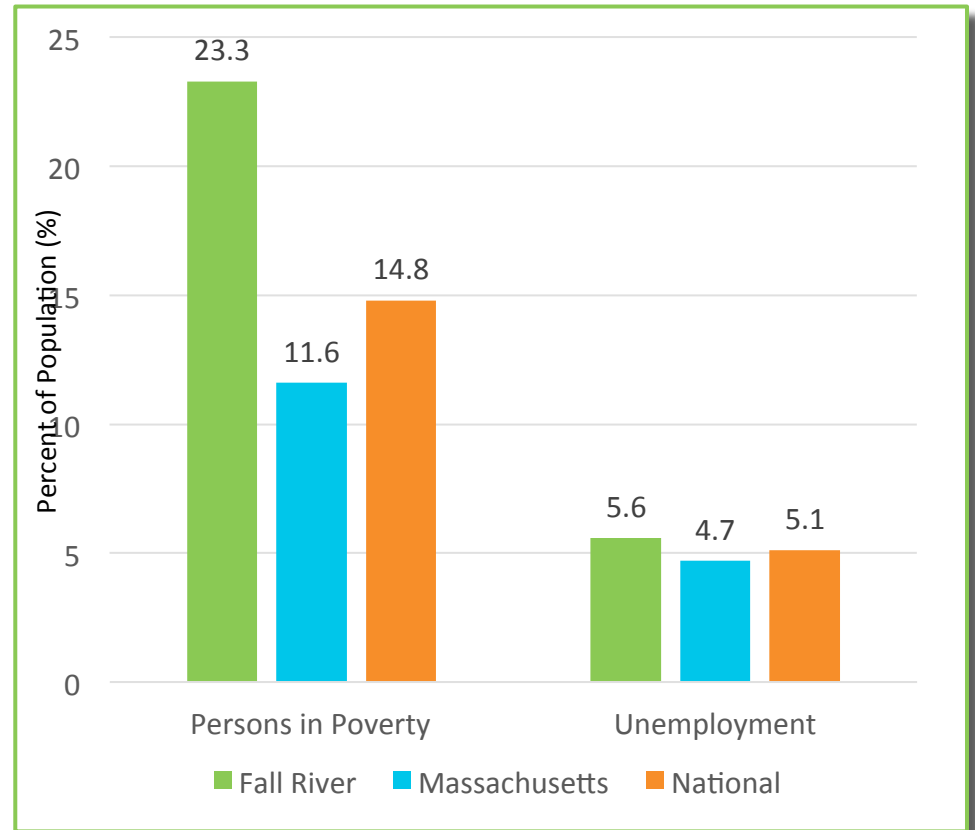
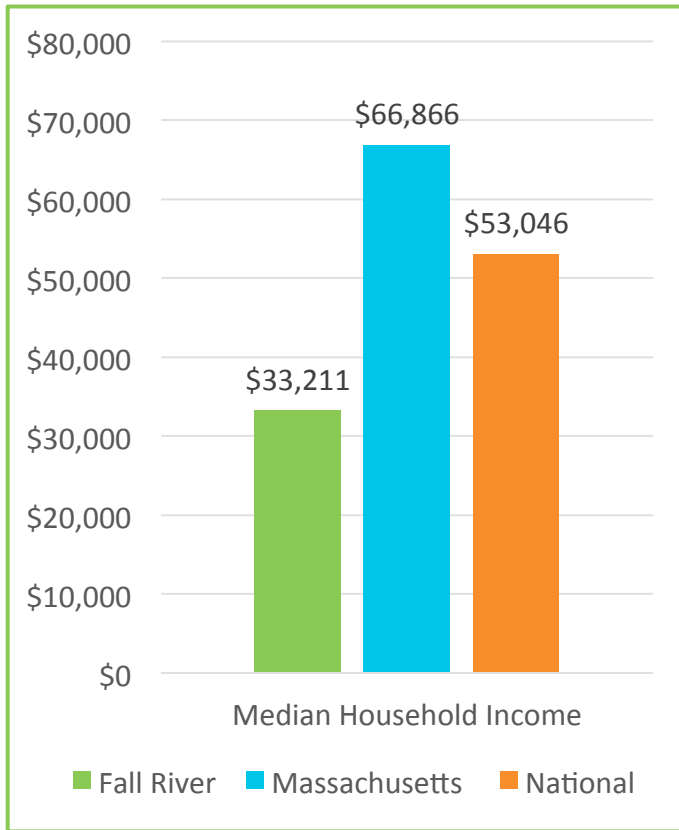
# Background

- Once the largest textile producer in the U.S.; now very little industry remains
- Portions of sewer infrastructure date back to late 19<sup>th</sup> century
- Many combined sewers cannot support current development
  - Chronic street flooding
  - CSOs
  - SSOs
- Shallow bedrock and urban soils=higher project costs



# Fall River, Massachusetts Statistics

- Population: 88,700+ (2014 estimate)



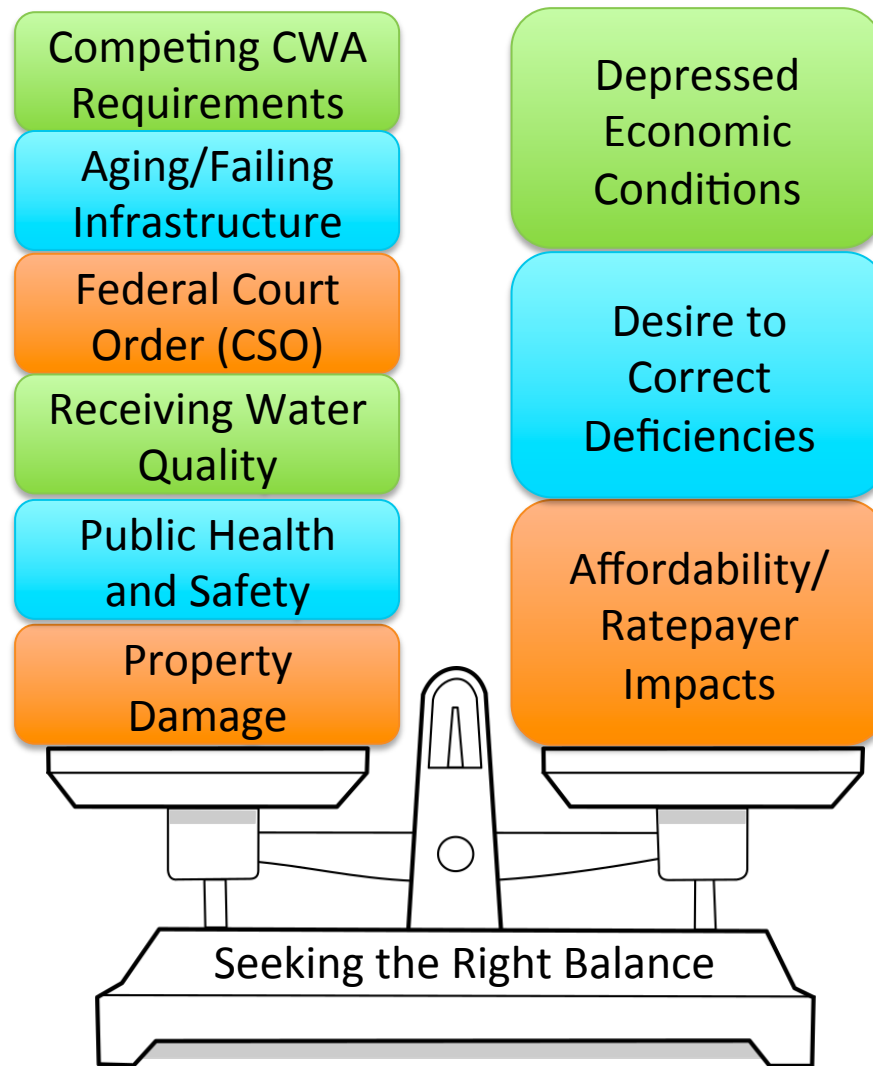
Sources: US Census American Bureau, Community Survey and US Bureau of Labor Statistics (10/2015)

# City at a Crossroads...

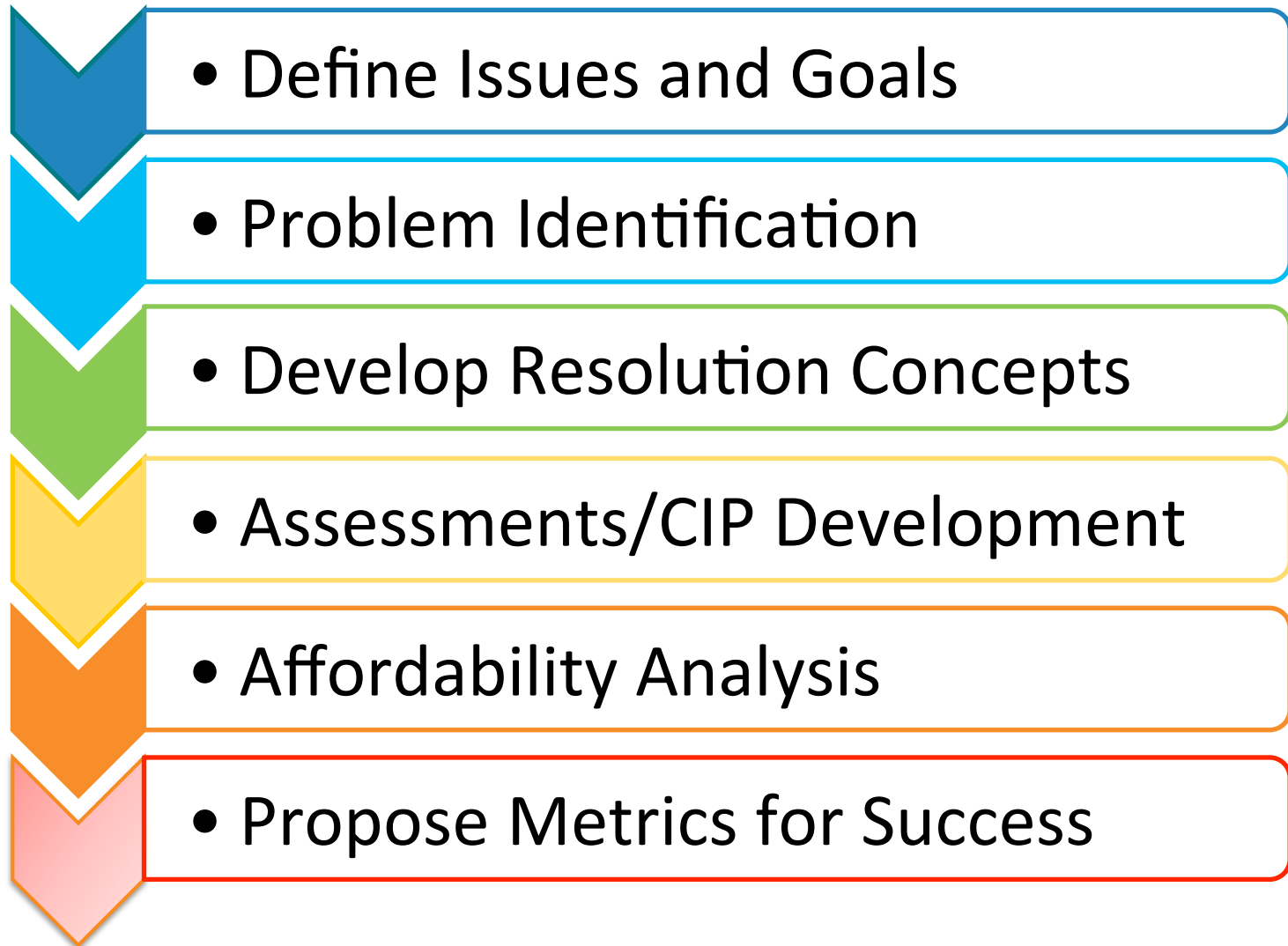
- Aging/failing infrastructure
- Unfunded regulatory/legal mandates
- Depressed economic conditions
- Public/governmental reluctance to raise rates
- Need to find the right balance of needs, requirements, and affordability



# Why Do Integrated Planning?



# Integrated Planning Process



# Integrated Planning Issues and Goals

- Water quality objectives
- Public health/safety
- Regulatory/legal requirements
- Need for infrastructure renewal
- Holistic implementation approach
- Green infrastructure and energy efficiency
- Affordable solutions
- Public awareness/support
- A sustainable, affordable, long-term Capital Improvements Program (CIP)





## Project Drivers: Regulatory/Legal

### Wastewater

- Municipal NPDES Permit
- Federal Court Order (CSO)
- EPA Administrative Order (SSO)
- Water Quality Standards/TMDLs
- Clean Air Act (Title V) Permit for WWTF

### Stormwater

- NPDES Massachusetts MS4 Permit
- Water Quality Standards/TMDLs
- Source Water Assessment and Protection (SWAP)





## Project Drivers: Institutional

- System reliability/infrastructure renewal
- Staffing and equipment needs
- Asset management
- Additional or revised policies
- Additional or revised O&M procedures





## Project Drivers: Social

- Public health and safety
- Chronic flooding
- Property damage
- Environmental impacts
- Affordability



# Over 100 Projects Identified

- Working together with City staff and multiple consultants
- Coordination DEP/EPA

Project Type	Projects Identified
Wastewater Treatment Plant	7
Wastewater Pump Stations	15
CSO Control	13
Wet-Weather SSO Control	22
Infrastructure Renewal	9 + Annual Program
Stormwater	20
Source Water Protection	7
Organizational/Institutional	6

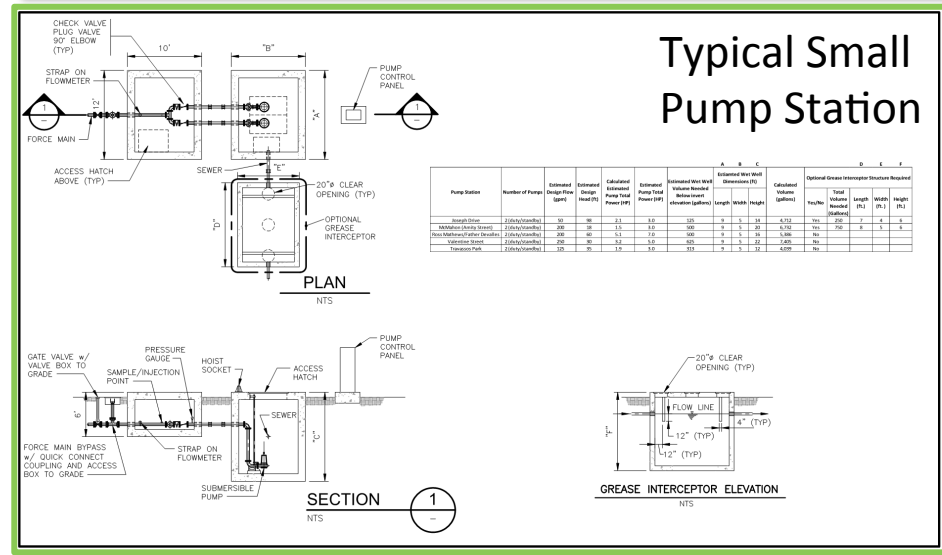
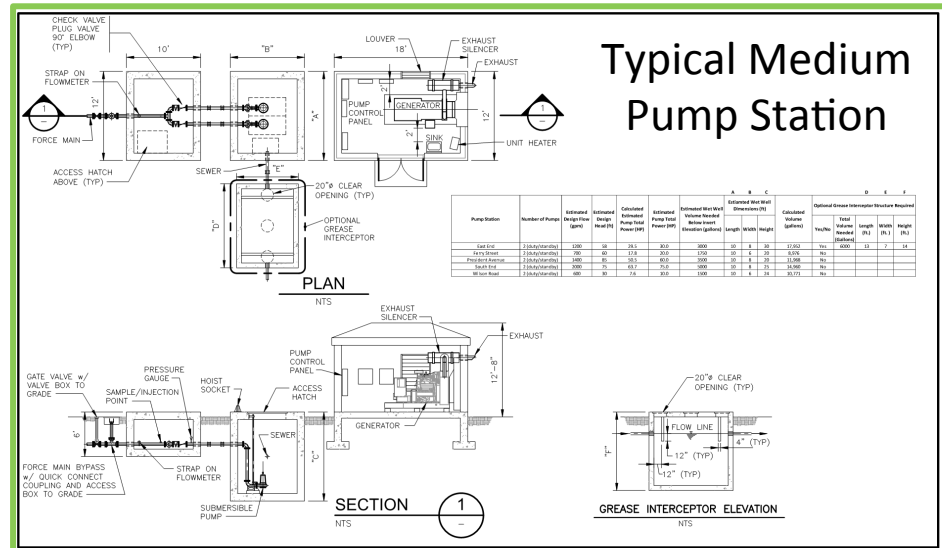
# Wastewater Treatment Facility

- Aging infrastructure
- Rehabilitation program
  1. Solids processing/operations
  2. Preliminary treatment
  3. Secondary treatment
  4. Primary treatment/disinfection/outfall
- Nitrogen removal upgrade
  - NPDES permit schedule (TBD)
- Maintenance vehicles and garage
- Wind turbine
- 7 projects



# Wastewater Pump Stations

- Remote facilities
- Most have little to no flow monitoring or SCADA
- Aging infrastructure
- Several constructed by developers
- 15 pump station projects
  - 11 to be replaced
  - 2 require upgrade
  - Uniform design approach recommended
  - 2 recently upgraded (future rehabilitation)



# CSO Control

## ■ Complete CSO Abatement Program

- Remaining Federal Court Order projects
- Must be completed by 2025
- 7 projects

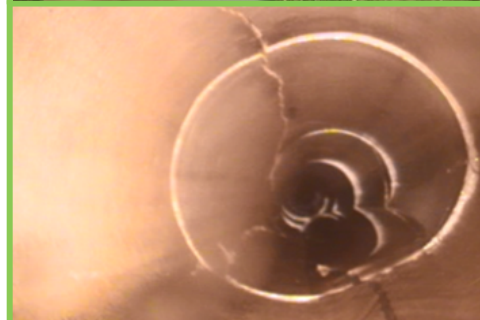
## ■ Maintenance of existing CSO controls

- Sediment build-up
- Corrosive environment
- Condition
- 6 projects



# Sewer Infrastructure

- Infrastructure management/  
dry-weather SSO control
  - Infrastructure renewal
  - Infiltration/inflow removal
  - 9 projects plus annual renewal program
- Wet-weather SSO control
  - Sewer separation
  - Increased sewer size/capacity
  - 22 projects



# Stormwater Infrastructure

- Address chronic street flooding
- Restore storage potential of river, brooks and channels
- Control strategy
  - Additional infrastructure
  - Infrastructure renewal
  - Cleaning and dredging of river, brooks and channels
  - Massachusetts MS4 Permit compliant
- 20 projects





# Source Water Protection

- Stormwater improvements to protect drinking water supply
- Compliant with SWAP report recommendations
- Watershed protection
- Flow interception
- 7 projects



# Organizational/Institutional Modifications

- Expanded O&M
- Asset management
- Computerized maintenance management system (CMMS)
- New/amended ordinances or policies
- Additional staffing/equipment
- 6 projects

Chapter 74 UTILITIES<sup>III</sup>  
 ARTICLE I. - IN GENERAL  
 ARTICLE II. - SEWER SYSTEM  
 ARTICLE III. - SEWER USE REGULATIONS  
 ARTICLE IV. - WATER SYSTEM

FOOTNOTE(S):

-- (1) --

The screenshot displays the 'UEM Asset Inventory Support Tool - Version: Beta 1.0.1.16815' interface. The main window shows asset details for 'Asset: 5-DDLN3-TRF-432', described as an 'ELECTRIC LINE'. The interface includes tabs for 'Asset Data', 'Specification Data', and 'Photos'. Below the asset details, there are sections for 'Asset Replace/Rehab Data' and 'Asset Condition Assessment'. A 'Return to Group Navigator' button is visible at the top of the asset details section.

Asset Details:

- ASSET NUM: 5-DDLN3-TRF-432
- DESCRIPTION: ELECTRIC LINE
- LOCATION: ROTA-EL-CKT-FDR07
- UNIFORMAT: J1030-Electric Utilities Distribution
- FEATURE ID: J1030150-Circuits
- RSL: [Dropdown]
- MANUFACT.: RTE MFG
- DI: [Dropdown]
- MODEL: [Dropdown]
- INSTALLED: 2007
- SER. NUM.: 856009211
- CLASS: Electric
- WORK CNTR: WER
- COMMENTS: [Text Area]
- DI COMMENTS: [Text Area]
- LOC. INFO: FEE
- MAXIMO DESC. TRA: [Text Area]
- DL: 30
- INV. CAT: RPI
- BAR CODED: [Checkbox]

Asset Replace/Rehab Data:

- Replacement Cost: \$25,000
- Rehabilitation Cost: \$5,000
- Minimum Acceptable Condition: 3
- Initial Rehabilitated Condition: 6
- Repeat Rehab Factor: 0.7
- Annual Maintenance Costs: Normal: \$1,910; Medium: \$2,101; High: \$2,311
- Life Extension Factors: Medium Factor: 1.02; High Factor: 1.05

Asset Condition Assessment:

- Date Last Inspected: [Date]
- Expected Condition: 1
- Observed Condition: 6
- Remaining Useful Life: 2
- Confidence Level Rating: [Value]

COMPUTERIZED ASSET MANAGEMENT PROGRAM

Asset Group: NBC > FWW > FPIP > Asset Base Data

Asset Group: FPIP

Asset ID: FFWHP0000MOT01

Location: [Text]

Description: Influent Pumping Pump # 1 Motor

Original Cost: \$25,000

Installed Date: 1/1/1989

Process: [Text]

Design Life: 20

Manufacturer: [Text]

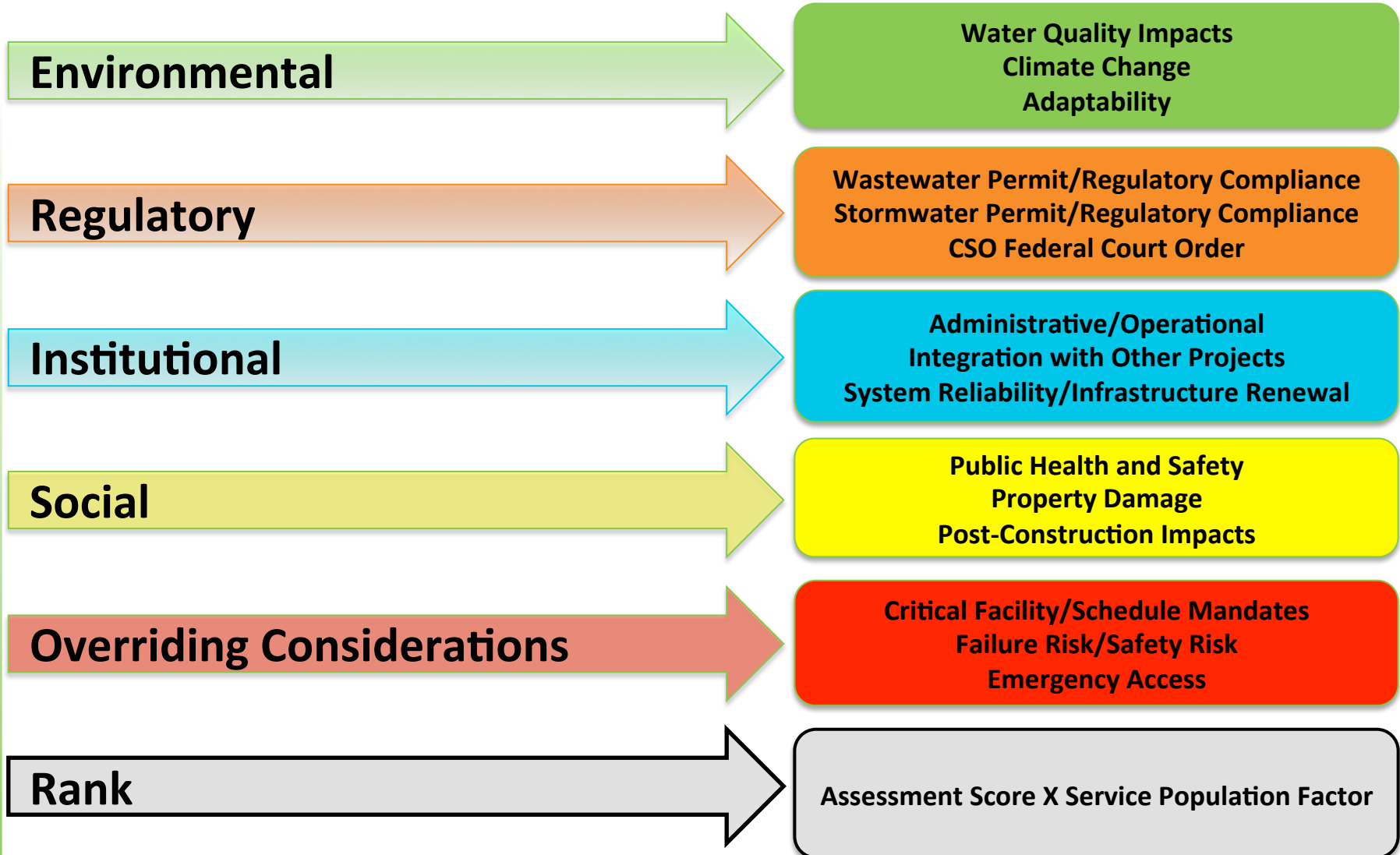
Calculate Asset Action Plan Based on Current Asset Settings (All Records on Page):

Year	Condition	Maintenance Cost	Renewal Action	Renewal Cost
2009	5.5	\$1,967	NONE	\$0
2010	5	\$2,026	NONE	\$0
2011	4.5	\$2,087	NONE	\$0
2012	4	\$2,150	NONE	\$0
2013	3.5	\$2,214	NONE	\$0
2014	3	\$2,281	REHAB	\$5,970
2015	2.5	\$2,349	NONE	\$0
2016	2	\$2,420	NONE	\$0

Present Worth Cost: \$1,026,962

Equivalent Annual Annuity: \$10,270

# Non-cost Assessment/Ranking



# CIP Development/Scheduling

- Project groupings in \$100-200M bundles
  - Highly ranked projects first
  - Meet mandated implementation schedules
  - Multi-year programs of varied projects
- Re-evaluate rankings periodically
- Support=Implementation
  - Public vote required for local funding
  - Strategic project groupings to address a range of issues
  - Program must be affordable
  - Public/governmental support are necessary



IMP Concept Assessment – DRAFT

Criteria	Weight	Criterion Weight	Water Quality	Climate Change	Regulatory	Administrative/Operational	System Reliability/Infrastructure	Social	Property Damage	Overlapping Considerations	Analysis	Assessment Score	Rank
Environmental	20%	50%	10%	2	2	2	2	2	2	2	1	1	1
Water Quality Impacts		20%	4%	2	2	2	2	2	2	2	1	1	1
Climate Change	20%	30%	6%	2	2	2	2	2	2	2	1	1	1
Adaptability (Changing Regulations and Environment)		20%	7%	0	2	2	2	2	2	2	1	1	1
Regulatory		35%	7%	2	2	2	2	2	2	2	1	1	1
Federal Permits/Regulatory Compliance (Wastewater)		30%	6%	0	0	0	2	2	2	2	2	2	2
NWQS Compliance (Stormwater)		30%	6%	0	0	0	2	2	2	2	2	2	2
CSO Federal Court Order Compliance	20%	25%	5%	0	0	2	2	2	2	2	2	2	2
Administrative/Operational Considerations		25%	5%	2	2	2	2	2	2	2	2	2	2
Integration with Other Projects		50%	10%	0	0	0	1	1	2	2	2	2	2
System Reliability/Infrastructure Renewal	20%	50%	10%	2	2	2	2	2	2	2	2	2	2
Social		30%	6%	2	2	2	2	2	2	2	2	2	2
Public Health & Safety		20%	4%	2	2	2	2	2	2	2	2	2	2
Property Damage		20%	4%	2	2	2	2	2	2	2	2	2	2
Post-construction Impacts (odors, noise, dust, traffic, etc.)		20%	4%	2	2	2	2	2	2	2	2	2	2
Overlapping Considerations		40%	8%	0	0	0	0	0	0	0	128	124	113
Critical Facility		30%	6%	0	0	0	0	0	0	0	84	84	84
Failure Risk/Safety Risk at Failure		30%	6%	0	0	0	0	0	0	0	10,752	10,416	9,644
Mandated Schedule Milestone		30%	6%	0	0	0	0	0	0	0	4	5	6
Emergency Access		100%	20%	2	2	2	2	2	2	2	11,592	11,592	11,592
Analysis											1	2	3
Assessment Score													
Benefiting Population (x 1,000)													
Total Score (Assessment Score x Benefiting Population)													

10/2/2015

# Affordability Analysis

- **Rate Impact Sensitivity Analysis**
  - Determine the impact of spending on sewer and stormwater rates (\$10M/year, \$20M/year, \$30M/year)
- **Financial Capability Assessment**
  - Follows EPA Framework (2014)
  - Residential Indicator (% of MHI)
  - Financial Capability Indicators
- **Funding Opportunities**
  - State Revolving Fund
  - MEMA/FEMA
  - Others

## FINANCIAL CAPABILITY ASSESSMENT FRAMEWORK

November 24, 2014

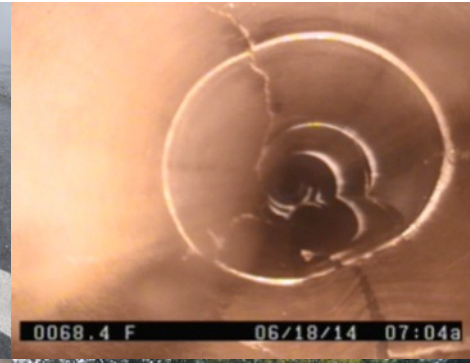
### Purpose

The Environmental Protection Agency (EPA) is committed to working with state and local government partners to assist local municipalities and local authorities to meet Clean Water Act (CWA) obligations in a manner that recognizes the unique financial challenges that local jurisdictions face. This financial capability assessment framework is intended to provide additional examples and greater clarity on the flexibilities built into existing guidance that local governments or authorities can use in assessing their financial capability, and the relationship between that assessment and consideration of schedules for permit and consent decree implementation. This framework builds on the progress already made in the May 2012 "Integrated Municipal Stormwater and Wastewater Planning Approach Framework," and the experience gained from talking with communities about their financial capability in actual, on the ground circumstances. Integrated Planning has been helping in identifying a permittee's relative priorities for projects based on the relative importance of adverse impacts on human health and water quality and the municipality's financial capability.

### Background

Local governments and authorities want to provide clean water for their communities, and they play an essential role in providing wastewater and stormwater infrastructure and services for their citizens, businesses and institutions. These municipal functions have been an important part of implementing the CWA to protect public health and improve water quality in streams, lakes, bays, and other waters nationwide. However, significant water quality challenges remain. Public officials remain strong supporters of the CWA goals and objectives by directing the public investments that are necessary to comply with the Act and to provide clean water for their citizens. Many local governments face complex water quality issues that are heightened by the need to address population growth or decline, increases in impervious surfaces, source water supply needs, and aging infrastructure. In recent years, many local governments and authorities have increased investments in their wastewater and stormwater infrastructure through capital projects to rehabilitate existing systems, improve operation and maintenance, and address additional regulatory requirements. As programs are implemented to improve water quality and attain CWA objectives, many state and local government partners find themselves facing difficult economic challenges with limited resources and financial capability. We recognize these challenging conditions and are working with states and local governments to develop and implement new approaches that will achieve water quality goals at lower costs and in a manner that addresses the most pressing problems first.

Long-term approaches to meeting CWA objectives should be sustainable and within a local government or authority's financial capability. The financial capability of these entities and other relevant factors are important to consider when developing appropriate schedules for infrastructure projects in permits or enforcement actions to help protect human health and the environment. EPA's financial capability assessment guidance, "Combined Sewer Overflows:



## Summary

- Significant need, limited funds
- Desire to correct deficiencies
- Need to implement in an affordable manner
- Plan provides a tool to help balance costs and objectives



# Questions